CLAIMS

What is claimed is:

5   1. A method of performing a capture threshold test in an implantable cardiac stimulation device, the method comprising:

loading a user-provided atrio-ventricular delay setting;

delivering a series of ventricular stimulation pulses following successive expirations of the atrio-ventricular delay setting;

10   verifying if capture occurs for each ventricular stimulation pulse; and

defining a ventricular capture threshold based on capture verification data.

15   2. The method of claim 1, wherein delivering the series of ventricular stimulation pulses comprises:

delivering a first ventricular pulse following the expiration of a first atrio-ventricular delay setting; and

delivering a second ventricular pulse following the expiration

20   of a second user-provided atrio-ventricular delay setting, during a myocardial refractory period to avoid myocardium depolarization.

3. The method of claim 1, further comprising adjusting a frequency of performing a periodic threshold test based on capture threshold stability.

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4. The method of claim 3, further comprising adjusting a frequency of storing the ventricular capture threshold based on the capture threshold stability.

30   5. The method of claim 2, wherein loading the user-provided atrio-ventricular delay setting comprises loading an AV delay setting.

6. The method of claim 2, wherein loading the user-provided atrio-ventricular delay setting comprises loading a PV delay setting.

7. The method of claim 1, further comprising storing the atrio-ventricular delay setting.

8. The method of claim 1, further comprising performing the threshold test in response to a loss of capture detection.

9. The method of claim 8, wherein performing the threshold test comprises performing the threshold test on a periodic basis.

10. The method of claim 3, wherein defining the ventricular capture threshold comprises storing a lowest stimulation output at which ventricular capture was verified.

11. The method of claim 1, further comprising storing a capture threshold in a threshold record.

12. The method of claim 11, wherein storing the capture threshold in the threshold record comprises adjustably storing the capture threshold on a periodic basis, based on the stability of the ventricular capture threshold.

13. The method of claim 11, wherein storing the capture threshold comprises storing a first capture threshold in a threshold record, which first capture threshold is not overwritten by a second capture threshold when the first capture threshold is determined to be unstable.

14. The method of claim 11, wherein storing the capture threshold comprises storing a first capture threshold in a threshold record, and

overwriting the first capture threshold by a second capture threshold when the first capture threshold is determined to be stable.

15. The method of claim 11, further comprising storing a first capture threshold in a threshold record and compressing data from consecutively defined capture thresholds of equal value.

16. The method of claim 11, further comprising displaying the capture threshold stored in the threshold record.

17. The method of claim 16, further comprising monitoring lead stability using the threshold record.

18. The method of claim 16, further comprising monitoring a clinical condition of a patient using the threshold record.

19. A method of storing capture threshold data in a cardiac stimulation device, the method comprising:

performing a capture threshold test in a cardiac chamber on a periodic basis;

determining a capture threshold;

determining a stability of the capture threshold; and

adjusting a frequency of storing the capture threshold data based on the capture threshold stability.

20. The method of claim 19, further comprising displaying capture thresholds stored in the threshold record.

21. The method of claim 20, further comprising using the threshold record to monitor any of lead stability or a clinical condition of a patient.

22. A cardiac stimulation device comprising:

a control circuit that loads a user-provided atrio-ventricular delay setting;

a pulse generator coupled to the control circuit, that selectively generates stimulation pulses for delivery to at least one cardiac chamber;

one or more electrodes, connected to the pulse generator, that deliver a series of ventricular stimulation pulses following successive expirations of the atrio-ventricular setting; and

wherein the control circuit verifies if capture occurs for each ventricular stimulation pulse, and defines a ventricular capture threshold based on capture verification data.

23. The cardiac stimulation device of claim 22, wherein the series of ventricular stimulation pulses comprise:

a first ventricular pulse following the expiration of a first atrio-ventricular delay setting; and

a second ventricular pulse following the expiration of a second atrio-ventricular delay setting, during a myocardial refractory period to avoid myocardium depolarization.

24. The cardiac stimulation device of claim 22, further comprising a timing circuit that adjusts a frequency of performing a periodic threshold test based on capture threshold stability.

25. The cardiac stimulation device of claim 24, wherein the timing circuit further adjusts a frequency of storing ventricular capture threshold data based on the capture threshold stability.

26. The cardiac stimulation device of claim 22, wherein the atrio-ventricular delay setting comprises an AV delay setting.

27. The cardiac stimulation device of claim 22, wherein the atrio-ventricular delay setting comprises a PV delay setting.

28. The cardiac stimulation device of claim 22, wherein the control circuit performs the threshold test in response to a loss of capture detection.

29. The cardiac stimulation device of claim 22, further comprising a data storage device that stores capture threshold records.

30. A cardiac stimulation device comprising:

a pulse generator that selectively generates stimulation pulses for delivery to a cardiac chamber;

one or more leads, connected to the pulse generator, that deliver stimulation pulses to the cardiac chamber; and

a control circuit that performs a capture threshold test in the cardiac chamber, and that determines a capture threshold based on the threshold test, wherein the control circuit further determines a stability of the capture threshold, and adjusts a frequency of performing the threshold test based on the capture threshold stability.

31. The cardiac stimulation device of claim 30, further comprising a data storage device that stores capture threshold records; and a display that visually displays stored capture threshold records.

32. The cardiac stimulation device of claim 31, wherein the capture threshold records stored in the data storage device are indicative of lead stability.

33. A cardiac stimulation device comprising:

means for acquiring a user-provided atrio-ventricular delay setting;

means for delivering a series of ventricular stimulation

5   pulses following successive expirations of the atrio-ventricular delay setting;

means for verifying if capture occurs for each ventricular stimulation pulse; and

means for defining a ventricular capture threshold based on

10   capture verification data.

34. The cardiac stimulation device of claim 33, wherein the verifying means performs the threshold test in response to a loss of capture detection.

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35. The cardiac stimulation device of claim 33, wherein the atrio- ventricular delay setting is any of a user-provided AV delay value, or an automatically adjustable AV delay setting.

20   36. The cardiac stimulation device of claim 33, wherein the atrio- ventricular setting is any of a user-provided PV delay value, or an automatically adjustable PV delay setting.

37. A cardiac stimulation device comprising:

25   means for selectively generating stimulation pulses for delivery to a cardiac chamber;

means for performing a capture threshold test in the cardiac chamber, for determining a capture threshold based on the threshold test, for determining a stability of the capture threshold,

30   and for adjusting a frequency of performing the threshold test based on the capture threshold stability; and

means for storing capture threshold records.

38. The cardiac stimulation device of claim 37, further comprising means for visually displaying stored capture threshold records.

5   39. The cardiac stimulation device of claim 38, wherein the stored capture threshold records are indicative of lead stability.